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Federal Communications Commission

WASHINGTON, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of:

Amendment of the Commission's
Rules to Establish New Personal
Communications Services

) GEN Docket No. 90-314
) ET Docket No. 92-100
)
) RM-7140, RM-7175, RM-7617,
) RM-7618, RM-7760, RM-7782,
) RM-7860, RM-7977, RM-7978,
) RM-7979 & RM-7980

REPLY COMMENTS OF TIME WARNER TELECOMMUNICATIONS

Respectfully submitted,

TIME WARNER TELECOMMUNICATIONS

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Time Warner Telecommunications
Reply Comments In Gen Docket No. 90-314

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SUMMARY

Time Warner Telecommunications ("TWT") envisions a personal communications service that will enable consumers to acquire a low-cost, lightweight phone or personal computing handset that may be used at home, in the office, in the car or while walking at prices competitive with -- or less than -- cellular.

TWT submits that in order to establish such a service, the Commission should allocate a minimum of 40 MHz per PCS licensee. The recommendation of the Commission's Office of Plans and Policy ("OPP") to allocate 20 MHz per licensee is based on an analysis that is both inconsistent with the characteristics many envision for PCS and at variance with expert studies. A minimum of 40 MHz per licensee must be allocated to assure sufficient spectrum to permit a PCS provider to avoid interference with existing fixed microwave licensees in the band and to competitively provide new and diverse low-cost services on a mass market basis. Proposals by other commenters for allocations of less than 40 MHz per PCS licensee are either unsupported or flawed. Some ignore the fact that spectrum is to be shared while others seek to incorrectly treat PCS as if it were simply going to be another cellular service.

TWT urges the Commission to issue two PCS licenses per market. PCS should not be viewed in a vacuum, as if it will not have to compete with cellular, enhanced SMR and other services. From the start, PCS will have to compete with a number of

established mobile communications providers. Licensing too many providers in each market may result in an individual licensee having inadequate spectrum to provide PCS and may delay the delivery of PCS to the public. Authorizing more than two PCS licensees per market will relegate PCS to being a niche service of limited availability and guarantee that PCS does not become a full-fledged competitor to cellular, thereby allowing the cellular duopoly to continue unabated.

The Commission should award one nationwide PCS license and one PCS license for each of the major trading areas. Marketplace forces have shown a consistent preference for large mobile communications service areas. There has been a clear trend towards consolidation in both the cellular and SMR industries. Licensing on a nationwide and major trading area basis will not limit entry or lessen either diversity or innovation, but will maximize spectral efficiency and allow for the provision of more specialized services to more customers.

Nationwide and regional licensing may also speed deployment of PCS to rural areas. In addition to a shorter licensing process which would result from the need to issue fewer licenses, nationwide and regional licensees will be able to deploy a system faster since less time will be required to resolve frequency coordination, roaming and compatibility issues with neighboring PCS systems. Lower overhead and capital costs associated with nationwide and MTA-sized PCS systems will also make rural PCS

more economically feasible and provide revenues from heavy demand areas to support rural operations.

Other than in the case of nationwide licensing, the Commission should exclude cellular licensees from becoming PCS licensees within their cellular service area. TWT supports an approach which would exclude licensing cellular entities that have a substantial overlap of ownership or service area with a PCS licensee in the same market. However, TWT believes that cellular companies should not be disqualified automatically from becoming the holder of a nationwide PCS license.

Finally, while TWT does not oppose local telephone company eligibility for PCS licensing, it does oppose the set-aside of spectrum for local telephone company wireless operations.

In conclusion, the Commission can, through its actions in this proceeding, stimulate the development of PCS on a cost-effective, consumer friendly basis and speed its deployment to those consumers who have, to date, been unable to afford the exciting possibilities provided by existing wireless services.

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**REPLY COMMENTS OF
TIME WARNER TELECOMMUNICATIONS
ON 1850-1990 MHz PERSONAL COMMUNICATIONS SERVICES**

Time Warner Telecommunications ("TWT"), by its attorneys, herein replies to certain comments filed in response to the Commission's Notice of Proposed Rule Making on Personal Communications Services ("PCS").¹

I. INTRODUCTION

As stated in its initial comments, TWT envisions a personal communications service that will enable consumers to acquire a low-cost lightweight phone or personal computing handset that may be used like a cordless telephone while in the home, yet may also be taken along to the office, used in the car or while walking around, at prices competitive with -- or less than -- cellular. PCS will become this low-cost, mass market set of personal

¹ Amendment of the Commission's Rules to Establish New Personal Communications Services, Notice of Proposed Rulemaking and Tentative Decision, 7 FCC Rcd 5676 (1992) (hereinafter "Notice").

communications services, however, only if the associated costs are kept low. PCS licensees must be granted a sufficient amount of spectrum over a wide area, unencumbered by technical restrictions, in order to recognize the economies of scale necessary to provide PCS to the mass market.

In a communications marketplace that will be populated by cellular, enhanced SMR, wide area paging, nationwide wireless data and local exchange services, PCS will add a different competitive dimension -- provision of wireless services to the average consumer. A review of the comments, however, reveals an effort by certain future competitors of PCS to have the FCC retard its development by allocating too little spectrum and establishing inefficiently small markets. TWT urges the FCC to reject these efforts and, instead, provide PCS with the usable spectrum, competitive standing, technical flexibility and nationwide scope that will establish it as a viable communications network of the future.

II. THE FCC SHOULD ALLOCATE A MINIMUM OF 40 MHZ PER LICENSEE.

In its Comments, TWT argued that at least 40 MHz should be assigned to each PCS licensee in order to meet forecasted demand economically, given that the spectrum is not clear and PCS support services must be provided in the same band.² This position has received considerable substantive support among the

² Comments of Time Warner Telecommunications at 4-7 (hereinafter "TWT").

commenters, including all three of the entities who have been tentatively awarded PCS Pioneer Preferences.³ In contrast, statements by other commenters in support of assignments of less than 40 MHz are conclusory and unjustified.

A. Clear Spectrum Requirements.

As discussed in TWT's Comments, Telocator has produced detailed estimates of the clear spectrum needed to provide PCS. The analysis concludes that, given two PCS providers, each provider requires at least 49 MHz of clear spectrum under current technology and optimistic deployment assumptions and at least 97 MHz of clear spectrum under current technology and conservative deployment assumptions.⁴

While it is the subject of further revision,⁵ the Telocator Study remains the most comprehensive and widely supported work on the subject in the industry. The assumptions and the methodology

³ See, e.g., Comments of MCI Telecommunications, American Personal Communications (hereinafter "APC"), Cox Enterprises, Associated PCN, Omnipoint Communications, PCN America, Motorola, Cablevision Systems, Comsearch, PerTel, Qualcomm and InterDigital Communications.

⁴ Comments of Telocator, Appendix B: Telocator Spectrum Estimates For PCS Report: An Analysis of Clear Spectrum Required To Support Emerging PCS Services, prepared by Telocator PCS Technical and Engineering Committee, May 28, 1992 at 3 (hereinafter "Telocator Study").

⁵ One minor revision that has been considered, for example, would better reflect traffic patterns produced by a finite (rather than infinite) subscriber population. Suggestions have also been made to examine the effect of licensing as many as five operators and employ average rather than maximum user densities. The appropriateness of these revisions has not been accepted by all industry experts involved in the process, however. Therefore, little weight should be attached to any of these newer results.

utilized in developing these spectrum estimates were vetted extensively by industry experts over the course of many months. Other spectrum requirement studies, including the one produced by the Commission's Office of Plans and Policy, have not received the same thorough peer review. Consequently, as discussed below, conclusions of that study should not be relied upon by the Commission in reaching judgments regarding the bandwidth of PCS assignments.

B. OPP Spectrum Allocation Recommendation is Insufficient.

The Commission has placed into the record a working paper entitled Putting It All Together: The Cost Structure Of Personal Communications Services by David P. Reed of its Office of Plans and Policy ("OPP").⁶ Among other things, the OPP Paper assesses the potential spectrum requirements of these new services by estimating the costs of delivering PCS, both using a stand-alone system and through the use of existing infrastructure.

The OPP Paper recognizes that a tradeoff between spectrum and hardware costs exists. Because some of the key assumptions used to develop the study's spectrum requirements would appear to overstate significantly the level of spectrum efficiency PCS ought to be expected to achieve, however, the extent of this tradeoff is underestimated substantially.

The OPP Paper generally concludes that a relatively modest amount of spectrum is sufficient for operators to deliver PCS

⁶ See Putting It All Together: The Cost Structure of Personal Communications Service, Office of Plans and Policy, Working Paper No. 28 (November 1992) (hereinafter "OPP Paper").

economically when using micro-cell sizes between 400 and 1600 meters.⁷ It specifically concludes that there is little variation in system costs for allocations larger than 20 MHz.

As discussed below, many of the key assumptions upon which the spectrum requirements analysis is based are either inconsistent with the characteristics many envision for PCS and/or vary substantially from the assumptions other analyses have employed. Cell sizes of 400 to 1600 meters assumed by the OPP Paper are consistent with a wireless system that will deliver wireline-type services. However, the OPP Paper employs usage rates, reuse parameters and channel bandwidths which are more closely aligned with today's higher priced, poorer quality vehicular mobile services. Indeed, the OPP model estimates that PCS capital costs will be substantially higher than wireline telephony. If this were true, a vision of low cost, widely available PCS service would be impossible to realize. In order to keep capital costs lower, the spectrum/hardware trade off must be made in favor of more spectrum and thus, lower capital costs.

For a fixed number of subscribers, the bandwidth required to deliver PCS services economically is affected by traffic volume (i.e., subscriber usage). For its base case, the OPP Paper assumed a usage rate of 0.03 erlang/sub, with variations of 0.01-0.12.⁸ While this rate is typical of cellular users, as is noted in the paper, a typical residential user generates a much greater

⁷ OPP Paper at 20.

⁸ OPP Paper at 23, 76, Appendix C (Table C-1).

volume of 0.1 erlang.⁹ Moreover, because early subscribers of PCS are likely to be heavier than average users, the relevant traffic volume might be many times the study's base case of 0.03 erlang.¹⁰ Of course, the demand in a business environment will be even heavier.

In addition to utilizing what appear to be unrealistically low traffic volumes, the OPP model assumes that PCS spectrum is used far more economically than might actually be the case. For example, a frequency reuse pattern of seven is assumed for the base case analysis (with variations between 1 and 16 examined). To achieve this level of efficiency (with coverage probabilities approaching 90%) in an 800 MHz cellular system typically requires sectorized (i.e., directional) antenna arrays. However, in order to meet the more stringent cost containment and coverage objectives of PCS, less elaborate antennas and reuse patterns well over 12 may be required in practice. In fact, to successfully address the three dimensional coverage and interference patterns within buildings may require reuse patterns larger than 30.

In addition, a 25 kHz channel bandwidth is assumed for the OPP Paper's base case (with variations between 20-70 kHz).¹¹ While this bandwidth can be obtained today (at somewhat degraded quality) by employing expensive voice coders, it is widely

⁹ OPP Paper at 76.

¹⁰ See Telocator Study at 3.

¹¹ OPP Paper at 24-25, Appendix C (Table C-1).

believed that economical PCS equipment will almost surely require wider channels.

In contrast to the OPP Paper assumptions, the Telocator PCS Technical and Engineering Committee spectrum estimates discussed above assumed a business usage rate of 0.25 erlang, reuse factors of between 12 and 24 and duplex channel bandwidths of 100 kHz (representative of 32 kb/s vocoders) and 50 kHz (16 kb/s).¹² These assumptions are much more consistent with what many envision PCS will be: a high quality, heavily used, economical service competitive with wireline and wireless services. For two providers, the Telocator study estimates of required clear spectrum varied from a minimum of 49 MHz to a maximum of nearly 200 MHz.¹³

C. Larger PCS Blocks are Needed to Share Frequencies with Fixed Users.

(1) The PCS Spectrum is Not Clear.

The Telocator estimates assume the allocation of clear spectrum. However, PCS will be sharing spectrum with numerous 2 GHz fixed microwave users, at least for some undecided transition period. Spectrum sharing between PCS and fixed users reduces significantly the amount of capacity available for PCS use. A recent analysis by APC involving eleven of the largest metropolitan areas indicates that a 40 MHz allocation would provide an average of only 25.7 MHz of available spectrum for

¹² Telocator Study; see also Comments of Omnipoint Communications at 6.

¹³ Telocator Study at 3.

each PCS licensee; 30 MHz yields an average spectrum availability of just 19.4 MHz.¹⁴ These average values, however, tend to hide the fact that in some areas, substantially less spectrum will be available for PCS operators.

Even under the shortest of proposed transition periods, PCS providers will be sharing the spectrum for a lengthy period of time and incurring considerable coordination costs of their own and relocation costs of the incumbents. Significantly, the sharing with these microwave users will necessarily occur during the earliest period of development for PCS, when it is most vulnerable to already well entrenched competition in the form of cellular, enhanced SMR and other communications services.

Most importantly, however, is the fact that public safety private microwave users will have infinite tenure in the spectrum on a co-primary basis with PCS providers. This, of course, means that absent voluntary relocation on their part, PCS providers will be sharing their spectrum as equals with these users permanently, thus increasing the necessary PCS spectrum requirements.¹⁵

The effect of existing fixed microwave operations on PCS operations will vary within and among markets depending on the

¹⁴ See Comments of APC at 11; APC Report on Spectrum Availability for Personal Communications Services Sharing, the 1850-1990 MHz with Band the Private Operational Fixed Microwave Service, November, 1992.

¹⁵ For example, in San Diego over 50% of the 108 microwave licensees in the 1850-1990 MHz band within 75 miles of San Diego are public safety users. Of these, 96% have 10 MHz allocations. See Comments of Cox Enterprises, Inc. at 8.

intensity of microwave use and the spectral location of that usage. This factor results in very different amounts of usable spectrum in different markets. It would also create significant disparities among the PCS competitors in a market depending upon which spectrum they were allocated.

(2) 40 MHz Assignments Facilitate Coordination.

Because it aligns well with the existing 2 GHz microwave channelization scheme, a 40 MHz PCS assignment plan can promote efficient spectrum use and minimize disruption to existing users. Most existing fixed microwave licensees in this band use a 10 MHz channel bandwidth.¹⁶ Since a PCS spectrum assignment is expected to be divided into two bands, one for each direction of transmission, each of the bands must be a multiple of 10 MHz in order to avoid having the bands overlap with each other or having one 10 MHz channel overlap the spectrum assigned to another PCS provider. For example, in the case of the Commission's proposed 30 MHz PCS assignment, each band would be 15 MHz which necessarily would overlap portions of two 10 MHz microwave channels. Similarly, one 10 MHz fixed microwave channel could overlap portions of two 15 MHz bands of two separate PCS licensees. The negotiations for relocation of existing fixed microwave users would thus be made more complicated by virtue of

¹⁶ It has been estimated that approximately 95% of fixed microwave licensees use 10 MHz bandwidths. The remainder utilize 5 MHz bandwidths. See Comments of Comsearch at 2 n.3; Comments of Omnipoint Communications at 10.

involving either two competing PCS providers or two incumbent fixed microwave users, depending on the nature of the overlap.¹⁷

Comsearch analyzed 30 MHz and 40 MHz assignments from the point of view of the impact on the existing microwave environment and determined that a 40 MHz assignment not only affords the PCS operator more flexibility in terms of system capacity, but it offers more available spectrum to avoid interfering with incumbent microwave licensees. This increase in spectral options is gained with only a marginal increase in the absolute number of impacted receivers.¹⁸

D. Proposals for Less Than 40 MHz Allocations are Unsupported or Flawed.

A surprising number of commenters make statements in support of spectrum assignments of less than 40 MHz per PCS licensee without providing any documentation and often completely ignoring the fact that the spectrum is to be shared.¹⁹ What is not surprising is that the vast majority of those commenters expressing support for spectrum assignments of only 20 or 25 MHz per PCS licensee are future competitors of PCS. For example, of the 23 telephone and/or cellular entities that commented on the

¹⁷ The OPP Paper discussed above acknowledges that to share spectrum most efficiently with existing fixed microwave users, the size of PCS assignments should be an integral multiple of 20 MHz. OPP Paper at 54.

¹⁸ Comments of MCI, Attachment: Comsearch, Inc., Analysis of 30 MHz PCS Block Allocation Versus 40 MHz Block Allocation, November, 1992.

¹⁹ See, e.g., Comments of Alltel, Cincinnati Bell, Southern New England Telephone, Telephone and Data Systems and the United States Telephone Association.

spectrum allocation issue, 18 of them support spectrum assignments of 20 MHz per PCS licensee.²⁰ Very few of these entities do more than merely state their support in a conclusory and undocumented manner.

There are those who weigh in on this issue by supporting 20-25 MHz assignments simply because "cellular providers serve their customers with only 25 MHz" or "such an allocation should be sufficient to support the type of PCS activity that can be reasonably projected."²¹ Others acknowledge that spectrum sharing with incumbent fixed microwave users will affect the usefulness of PCS spectrum, but their suggestions for addressing this problem do not recognize its severity. These suggestions range from the unrealistic -- the rapid relocation of the incumbents²² -- to the inadequate -- allowing for a nominal spectrum reserve.²³ Some of these commenters do not even account for the likelihood that spectrum sharing means that few PCS licensees will have full use of any spectrum assigned to them.

²⁰ It is also noteworthy that these entities uniformly support the licensing of 5 PCS licensees per service area.

²¹ Comments of Pacific Telesis Group at 35-36; Rock Hill Telephone Company, et al. at 4; South Carolina Telephone Association at 3; Century Cellunet at 9 (extent of demand is uncertain); Alltel at 16 (conclusory concern of overallocating spectrum for an array of services that are still emerging).

²² See Comments of Pacific Telesis Group at 36 n.13.

²³ See Comments of Alltel Service at 16 (5 MHz reserve); Century Cellunet at 9 (5 MHz reserve); Bell Atlantic Personal Communications at 38 (add 2 MHz); Southwestern Bell Telephone at 9 (add 5 MHz).

Arguments for small PCS spectrum assignments are the arguments of choice for future competitors of PCS. These arguments are a thinly veiled protectionist attempt to neutralize the benefits of a new technology. These commenters use the cellular spectrum allocation as the baseline determining factor for PCS spectrum assignments and then claim that the digital nature of PCS systems warrant less clear spectrum than cellular has been allocated.²⁴ In particular, they contend that since cellular licensees have 25 MHz of spectrum and provide service in an analog mode, a comparable amount of spectrum for digital PCS would be anywhere from 10 to 25 MHz.

This analogy fails on numerous grounds. Most fundamentally, the notion that simply because PCS is expected to compete with cellular service it should be treated as if it were cellular service is seriously flawed. While PCS and cellular service will compete with one another, they will not be identical. Differences will exist in the design and cost structure of the underlying networks, as well as in services to be provided and the expected demand for the services. These types of considerations rather than the impact on well-entrenched cellular competitors should determine the spectrum needed to provide PCS.²⁵ New technologies, products and services enter the

²⁴ See Comments of Century Cellunet at 9; GTE at 29-32; Centel at 10, n.15.

²⁵ Some commenters appear to have adopted the unusual approach of making the amount of spectrum to be assigned a function of the number of licenses to be awarded. See, e.g.,
(continued...)

marketplace all the time without being constrained because of their impact on existing competitors.²⁶

Several commenters claim that PCS systems should be assigned a smaller amount of spectrum than cellular systems because the same amount of spectrum will give PCS systems greater capacity due to their use of digital technology.²⁷ These are poorly grounded assertions. The cellular industry began consideration

²⁵(...continued)

Comments of Telephone and Data Systems at 5-8. TWT believes that the Commission must first determine the amount of spectrum needed to provide low-cost mass market PCS on a wide scale. The number of licensees should be a function of the amount of the determined spectrum needs (based on spectrum available for assignment) coupled with consideration of the competitiveness of the mobile communications market.

²⁶ In eliminating the Carroll Doctrine and the UHF impact policy as factors in the broadcast licensing process, the Commission concluded that the public interest was no longer served by considering the possible economic injury to existing broadcast stations of authorizing a new or enhanced full-service broadcast facility. Policies Regarding Detrimental Effects Of Proposed New Broadcasting Stations On Existing Stations, 64 RR 2d 583 (1988), recon. 66 RR 2d 19 (1989) (theory of ruinous competition is no longer a widely accepted economic theory.) Certainly the advent of VHS disadvantaged Sony Corporation and its Betamax video tape format which at the time had the video cassette market to itself. See Will Apple Learn From Betamax, Forbes, p.10, October 29, 1990. Even a government prodded change such as the introduction of airbags can place manufacturers who do not offer the product at a competitive disadvantage. See Can Detroit Hold Its Lead In Safety, Business Week, p.127, November 26, 1990 (noting how domestic automakers who offered airbags had made significant gains at the expense of automakers who did not offer airbags).

²⁷ It is curious that cellular operators are so concerned about the amount of spectrum assigned to PCS licensees when many of them are not being pressed to capacity by demand. See BellSouth is not rushing digital development, Mobile Phone News Subscriber Supplement, September 10, 1992 (According to Trish McLaughlin, spokeswoman for BellSouth Mobility, "We simply do not have capacity problems in most of our markets.")

of digital technology at least as early as 1987. Moreover, many cellular operators are already beginning to implement digital technology in their cellular systems.²⁸

Cellular operators complain that they are somehow handicapped from converting to digital technology by the existence of a large analog customer base and that such a handicap justifies assigning PCS providers less spectrum.²⁹ This argument is specious. One of the biggest advantages that cellular operators have relative to new entrants in the mobile communications marketplace is that they have an entrenched customer base. The fact that technology has advanced is hardly an excuse for purposely limiting the potential of the emerging technology. Moreover, concerns over the impact of the switch to digital on existing analog subscribers of cellular service are being addressed through the development of dual-mode subscriber

²⁸ TDMA Has Been Selected As Standard, But CDMA Is Gaining Visibility And Proponents, Global Telecom Report, No. 8, Vol. 2, July 27, 1992 (McCaw Cellular Communications' "major regional systems in the Pacific Northwest and Florida will be digital by the end of 1992 and the rest of its markets -- primarily in the Rocky Mountain states and the central region of the country -- will have the service by mid-1993."); San Diego Company Shipping TDMA Chipsets For Dual-Mode Cellular Telephones, Edge Chips, No. 208, Vol. 7, July 20, 1992 ("By the end of 1992, cellular carriers will begin deploying TDMA digital cellular service in many major U.S. markets . . . Los Angeles, New York, Boston, Chicago and Dallas . . .") As an interim measure, some operators are using NAMPS, a hybrid analog/digital technology developed by Motorola, Inc. that boosts cellular capacity by up to 300 percent.

²⁹ See Comments of the Cellular Telecommunications Industry Association (hereinafter "CTIA") at 30-31; Comments of Southwestern Bell at 10-11; Comments of Vanguard Cellular Systems at 6; and Comments of Centel at 10 n.15.

units that allow users to access a transitioning system either in its analog or digital mode.³⁰

In sum, the contentions of cellular carriers that they will be disadvantaged by the assignment of 40 MHz to PCS licensees are unjustified. As discussed earlier, PCS licensees require at least 40 MHz of spectrum to maneuver around the fixed microwave incumbents and to access a competitive amount of clear spectrum to provide new and diverse services economically. Moreover, current expectations for the use of digital technology and dual mode subscriber units by cellular systems undermine any claims by cellular carriers that the advent of digital PCS will result in unfair competition for cellular service.

III. THE FCC SHOULD ISSUE TWO PCS LICENSES PER MARKET AREA.

In its Comments, TWT supported the authorization of two PCS providers per market area.³¹ A review of the comments reveals

³⁰ See Reuters News Service, Hughes Network Says New Product Has FCC Approval, Financial Report, August 3, 1992 ("The telephone is in production and shipping will begin this summer. Orders for more than 60,000 units have been received."); San Diego Company Shipping TDMA Chipsets For Dual-Mode Cellular Telephones, Edge, Chips, No. 208, Vol. 7, July 20, 1992 ("Dual-mode mobile telephones are currently on order in volume by numerous cellular carriers. These phones are comparable in size to today's analog mobile phones. Handheld dual-mode phones will be available in 1993."); TDMA Has Been Selected As Standard, But CDMA Is Gaining Visibility And Proponents, Global Telecom Report, No. 8, Vol. 2, July 27, 1992 ("Four different manufacturers are providing 40,000 dual-mode phones -- a combination of transportable, portable, and hand-held units.")

³¹ Comments of TWT at 10-11.

considerable support for the issuance of two PCS licenses per market area.³²

Some commenters have expressed support for the authorization of more than two PCS providers per market area because of dissatisfaction with the level of cellular service competition that has resulted from the licensing of two cellular service providers per market.³³ TWT believes that the analogy to cellular service for these purposes is inapt. While analogizing to the cellular experience, these commenters nonetheless view PCS in a vacuum, as if it were going to face no significant competition from cellular or any other services. The facts are otherwise.

The relevant market for purposes of a PCS market structure or competition analysis should be the mobile communications market as a whole and not simply PCS. This market is populated by many services, some of which will offer limited competition to PCS but others, such as cellular and enhanced SMR services, can be expected to provide full-scale competition.

³² See, e.g., Comments of TWT, APC, Associated, Ericsson, Motorola, Omnipoint, PerTel, Qualcomm, Viacom and Tel/Logic.

³³ See Comments of Fleet Call at 8; and Comments of the U.S. Department of Justice at 6.

Cellular currently does face only limited competition.³⁴ PCS should be authorized precisely to provide the needed competition to cellular. Authorizing two PCS providers would inject such competition into the mobile communications marketplace while giving the nascent PCS providers the necessary spectrum to provide new and diverse low-cost services on a mass market basis.³⁵ On the other hand, authorizing more than two providers will guarantee that cellular does not face full-fledged competition in the future. Introducing a greater number will result in limited availability niche PCS offerings and the cellular duopoly will continue unabated.³⁶

Some commenters argue that greater diversity and innovation will result from the existence of more than two PCS licensees.³⁷ These commenters promote the concept of "niche" services to cloak

³⁴ U.S. General Accounting Office, Telecommunications: Concerns About Competition in the Cellular Telephone Industry, p.21 (July 1992); Evan R. Kwerel and John R. Williams, Federal Communications Commission, Changing Channels: Voluntary Reallocation of UHF Television Spectrum, OPP Working Paper Series 27 (November 1992); Public Util. Comm'n of Cal., Investigation On the Commission's Own Motion Into the Regulation of Cellular Radiotelephone Utilities. Decision 92-10-026 (October 6, 1992).

³⁵ The OPP Paper discussed above concludes that, so long as each PCS licensee is assigned at least 20 MHz, no limit be placed on the number of PCS licensees. However, no attempt is made to quantify the social benefits of this competitive arrangement.

³⁶ Given the natural incentive of cellular companies to support solutions which minimize competition for its services, the FCC should consider suspect the recommendations of those companies in favor of licensing a greater number of PCS providers.

³⁷ See Comments of Cellular Communications at 10; and Comments of PCN America at 5.

their desire to avoid direct competition to cellular. Specifically, BellSouth apparently envisions many PCS licensees, each serving specialized "niche" markets, either in the type of service offered or in the geographic area served.³⁸ This is a non-competitive vision where PCS providers would not be full-fledged competitors among themselves or vis-a-vis other services such as cellular or enhanced SMR. TWT supports diversity of services but believes that it is best encouraged by licensing two PCS providers per market in competition with themselves and with the existing communications services. Viewed in the context of a mobile communications market, two PCS licensees can be expected to maximize their efforts to differentiate their services and products from those of their existing competitors.³⁹

Other commenters support the licensing of more than two PCS providers per market simply because the more licenses that are available, the more opportunity interested parties have to become licensees. This rationale has only superficial appeal. The licensing of many PCS providers means that each such provider will be assigned a more limited amount of spectrum to provide its service. Inadequate spectrum assignments coupled with large

³⁸ Comments of BellSouth at 22.

³⁹ As a corollary to its proposal to license many PCS providers, BellSouth would also require PCS systems to be low-power microcell networks. Id. Regardless of whether mature PCS systems reflect that configuration, TWT believes it is crucial to the launching of PCS that licensees be afforded the technical flexibility necessary to adjust the power/height of base stations within their systems as needed to provide the emerging PCS services on a low-cost basis. See Comments of TWT at 12-13.

fixed costs, significant competition from existing services and uncertain future demand could lead many or all PCS licensees not to construct PCS networks or, if allowed, to consolidate licenses.⁴⁰ In either event, this process could be expected to delay the delivery of PCS to the public, to the benefit only of existing competitors.

In view of the foregoing, TWT supports the licensing of two PCS providers per market area with at least 40 MHz of spectrum to enable realization of significant scale and spectrum economies and network efficiencies.

IV. THE FCC SHOULD LICENSE ON A NATIONWIDE AND MAJOR TRADING AREA BASIS.

The Commission tentatively concluded "that PCS market areas should be larger than those initially licensed in cellular" and proposed four service area options.⁴¹ As discussed in its Comments, TWT supports the designation of one nationwide PCS

⁴⁰ Use of the spectrum assigned to PCS licensees generally is also impacted by the number of PCS licensees. As has been discussed, supra, the sharing of spectrum between incumbent fixed microwave users and PCS providers will be a technically complicated process. The licensing of many PCS providers, by injecting more parties into the negotiations, complicates the already sensitive interference and coordination aspects of the spectrum sharing relationship. Stated another way, the fewer the number of licensees, the less the sharing conflict with incumbent microwave users.

⁴¹ Notice at 5700-5701 (The four options were the 487 Rand McNally Basic Trading Areas ("BTAs"), the 47 Rand McNally Major Trading Areas ("MTAs"), the 194 LATAs, and a nationwide service area.)

licensee and one PCS licensee for each of the MTAs.⁴² Support for some form of nationwide PCS licensing in this proceeding comes from a diverse group of commenters.⁴³

Marketplace forces have shown a consistent preference for large mobile communications service areas. The history of the U.S. cellular industry reveals a clear trend towards regional consolidation. A similar trend towards consolidation has been occurring in the SMR industry.⁴⁴ On the regulatory front, the Commission has noted that "developments in recent years demonstrate a growing demand for nationwide land mobile

⁴² Comments of TWT at 7-10.

⁴³ See Comments of Bell Atlantic Personal Communications, Inc. at pages 15-28; Licensing Proposal of PCN America, Inc. dated October 20, 1992; Comments of Power Spectrum, Inc. at pages 5-6; Comments of MCI Telecommunications Corp. at pages 8-13; Appendix D to Comments of Interdigital Communications Corp.; Comments of In-Flight Phone Corporation at page 8; Comments of dbX Corporation at page 3; Comments of CELSAT at page 13, and Comments of the Manager of the National Communications System, Department of Defense, Attachment B at page 5.

Other commenters ignore the Commission's conclusion and all four of the proposed options and instead suggest the use of Metropolitan Statistical Areas ("MSAs") and Rural Service Areas ("RSAs") as in the case of cellular service. See, e.g., Comments of Alltel, BellSouth, CTIA and Fleet Call. Not surprisingly, most of these commenters have a significant stake in existing services that will compete with PCS. For example, thirty-three (33) of these commenters are telephone company/cellular affiliates.

⁴⁴ See Fleet Call's Purchase of Discom Creates Giant SMR East Coast Corridor, Land Mobile Radio News (January 1, 1993) at pp. 4-5; See also Order, PR Docket No. 86-3, FCC 92-270, released July 15, 1992; Requests for Rule Waivers to establish enhanced SMR systems have been filed by numerous parties. See, e.g. Fleet Call, Inc. (Granted); Advanced Radio Communications Services of Florida, Inc. (Granted); CenCall, Inc. (Filed May 15, 1992); Dial Page, L.P. (Filed June 22, 1992).